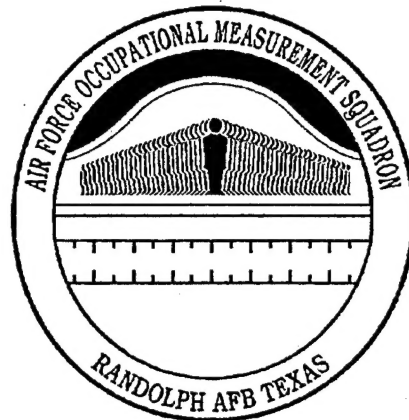




**UNITED STATES
AIR FORCE**



OCCUPATIONAL SURVEY REPORT

BIOMEDICAL EQUIPMENT

AFSC 4A2X1

AFPT 90-4A2-034

FEBRUARY 1996

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**OCCUPATIONAL ANALYSIS PROGRAM
AIR FORCE OCCUPATIONAL MEASUREMENT SQUADRON
AIR EDUCATION and TRAINING COMMAND
1550 5th STREET EAST
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882 TSS/TSOXC (925 MISSILE ROAD, SHEPPARD AFB TX 76311-2245)	1		1	

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PREFACE

This report presents the results of an Air Force Occupational Survey of the Biomedical Equipment career ladder, Air Force Specialty Code 4A2X1. Authority for conducting occupational surveys is contained in AFI 36-2623. Computer products used in this report are available for use by operations and training officials.

The survey instrument was developed by Captain Carol A. Owen (CAF), Inventory Development Specialist, with computer programming support furnished by Mrs. Jeanie Guesman and administrative support provided by Mr. Richard G. Ramos. 2Lt Joseph D. Dyer, Occupational Analyst, analyzed the data and wrote the final report. This report has been reviewed and approved by Mr. Daniel E. Dreher, Chief, Airman Analysis Section, Occupational Analysis Flight, Air Force Occupational Measurement Squadron (AFOMS).

Copies of this report are distributed to Air Staff sections, major commands, and other interested training and management personnel. Additional copies are available upon request to AFOMS, Attention: Chief, Occupational Analysis Flight (OMY), 1550 5th Street East, Randolph Air Force Base, Texas 78150-4449 (DSN 487-6623).

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SUMMARY OF RESULTS

1. Survey Coverage: The Biomedical Equipment career ladder was surveyed to provide current job and task data. Survey results are based on responses from 431 members (75 percent of the total assigned personnel selected for survey). The sample satisfactorily represents the overall career ladder population.
2. Specialty Jobs: One cluster (including four jobs) and three independent jobs (IJ) were identified in the career ladder structure analysis. Seventy-five percent of the survey sample performed the core job of Biomedical Equipment Maintenance. These personnel maintained a vast array of biomedical and support equipment. The remaining three IJs are related to supervisory, managerial, and training functions.
3. Career Ladder Progression: Skill-level progression for members of this AFSC is typical of most career ladders. Three-skill level personnel almost exclusively spend their time performing technical tasks involving maintenance of a wide variety of biomedical and support equipment. At the 5-skill level, personnel are still heavily involved with technical task performance, but become involved in instructor and facility management positions. Seven-skill level members are much more involved in supervisory and facility management positions, yet half remain in technical maintenance positions. Nine-skill level and CEM personnel are greatly involved in supervision and some facility management.
4. AFMAN 36-2108 Specialty Description: The description accurately describes the technical and supervisory aspects of jobs at the various levels.
5. Training Analysis: A comprehensive review of the STS found that most paragraphs were supported by the survey data. However, several paragraphs need to be reviewed for possible fine-tuning of content and 3-skill level proficiency codes. The Plan of Instruction was not covered in this report due to recent changes being worked at the technical school.
6. Job Satisfaction: Job satisfaction appears to be extremely high among most personnel. Only Facility Manager incumbents showed any major problems related to their job satisfaction, especially in the perceived utilization of training.
7. Implications: Overall, survey data for the Biomedical Equipment Maintenance career ladder reflect a well functioning career ladder. Seventy-five percent of the job incumbents perform a core job relating to maintenance of various medical equipment across the Air Force. Good career ladder progression can be seen as one moves from the 3-skill level to the 9- or CEM-skill level. Job satisfaction appears to be extremely high among most personnel. A comprehensive review of the STS found that most paragraphs were supported by the survey data. However, several paragraphs need to be reviewed for possible fine-tuning of content and 3-skill level proficiency codes.

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**OCCUPATIONAL SURVEY REPORT (OSR)
BIOMEDICAL EQUIPMENT CAREER LADDER
(AFSC 4A2X1)**

INTRODUCTION

This is a report of an occupational survey of the Biomedical Equipment career ladder completed by the Air Force Occupational Measurement Squadron (AFOMS). This data will be utilized to evaluate the AFMAN 36-2108 *Specialty Description* and training documents. The last OSR was published in January 1989.

Background

As described in the AFMAN 36-2108 *Specialty Description*, dated 31 October 1994, Biomedical Equipment members install, inspect, repair, and modify biomedical equipment and support systems. Members perform prepurchase evaluations of medical devices and advise on operational theory, underlying physiological principles, and safe clinical applications of biomedical equipment. Members implement organizational maintenance support for all medical devices used within the medical treatment facility, medical research laboratories, air transportable hospitals and clinics, and contingency hospitals. AFSC 4A2X1 airmen provide technical guidance and intermediate maintenance support on medical equipment systems when assigned to a regional Medical Equipment Repair Center, and direct the facility management program when assigned.

Entry into the career ladder currently requires an Armed Services Vocational Aptitude Battery Electronic score of 67. The sequence of technical training for this AFSC begins with course L3AQR4A231-800, Electronic Principles, a 47-day course taught at Lackland AFB TX. Upon completion of Electronic Principles, students proceed to Biomedical Equipment Apprentice Course J3ABR4A231-001 (34 weeks) at Sheppard AFB TX. This course provides technical training for Biomedical Equipment Apprentice personnel to include clinical application, operation, inspection, maintenance, and modification of a wide variety of biomedical equipment systems used in fixed and mobile medical and dental treatment facilities of the Air Force.

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SURVEY METHODOLOGY

Inventory Development

The data collection instrument for this occupational survey was USAF Job Inventory (JI) Air Force Personnel Test 90-4A2-034, dated 24 October 1993. A tentative task list was prepared after reviewing pertinent career ladder publications and directives, pertinent tasks from the previous survey instrument, and data from the last OSR. The preliminary task list was refined and validated through personal interviews with 24 subject-matter experts (SMEs) at the technical training location and at the following installations:

<u>BASE</u>	<u>UNIT VISITED</u>
Sheppard AFB TX	384 TRS/HTSR
Travis AFB CA	DGMC/SGLE
Lackland AFB TX	WHMC/HSLM
Randolph AFB TX	12 MEDGP/SG
Brooks AFB TX	AL/DOJM

The resulting JI contains a comprehensive listing of 1,274 tasks grouped under 10 duty headings and a background section requesting such information as grade, duty title, organizational level, type of facility where employed, testing and calibration equipment used, and equipment maintained.

Survey Administration

From March through July 1995, Base Training Offices administered the inventory to 496 eligible AFSC 4A2X1 personnel. To qualify for the survey, personnel were required to hold a duty AFSC of 4A231, 4A251, 4A271, 4A291, or 4A200. Excluded from the survey were personnel in PCS, student, or hospital status, or with less than 6 weeks on the job. Job incumbents were selected from a computer-generated mailing list obtained from personnel data tapes maintained by the Air Force Personnel Center, Randolph AFB TX.

Each individual who completed the inventory first completed an identification and biographical information section and then checked each task performed in his or her current job. After checking all tasks performed, each member then rated each of these tasks on a 9-point

scale, showing relative time spent on that task, as compared to all other tasks checked. The ratings ranged from 1 (very small amount time spent) through 5 (about average time spent) to 9 (very large amount time spent).

To determine relative time spent for each task checked by a respondent, all of the incumbent's ratings are assumed to account for 100 percent of his or her time spent on the job and are summed. Each task rating is then divided by the total task ratings and multiplied by 100 to provide a relative percentage of time spent for each task. This procedure provides a basis for comparing tasks in terms of both percent members performing and average percent time spent.

Survey Sample

Personnel were selected to participate in this survey so as to ensure an accurate representation across major commands (MAJCOM) and military paygrade groups. All eligible AFSC 4A2X1 personnel were mailed survey booklets. Table 1 reflects the percentage distribution, by MAJCOM, of assigned AFSC 4A2X1 personnel as of March 1995. The 431 respondents in the final sample represent 75 percent of the total assigned personnel. Table 2 reflects the paygrade distribution for these AFSC 4A2X1 personnel. The survey sample is considered to be a satisfactory representation of the career ladder population.

TABLE 1

COMMAND DISTRIBUTION OF AFSC 4A2X1 PERSONNEL

COMMAND	PERCENT OF ASSIGNED*	PERCENT OF SAMPLE
AETC	27	28
ACC	18	19
AMC	17	16
AFMC	12	14
USAFE	11	9
PACAF	9	9
AFSPACECOM	3	4
OTHER	3	1
TOTAL	100	100

TOTAL ASSIGNED* = 575

TOTAL SURVEYED** = 496

TOTAL IN SURVEY SAMPLE = 431

PERCENT OF ASSIGNED IN SAMPLE = 75%

PERCENT OF SURVEYED IN SAMPLE = 87%

* Assigned strength as of 1 March 1995

** Excludes personnel in PCS, student, or hospital status, or less than 6 weeks on the job

TABLE 2
PAYGRADE DISTRIBUTION OF SURVEY SAMPLE

GRADE	PERCENT OF ASSIGNED*	PERCENT OF SAMPLE
E-1 - E-3	8	8
E-4	28	27
E-5	30	32
E-6	18	17
E-7	14	13
E-8	1	2
E-9	1	1

* Assigned strength as of March 1995

Task Factor Administration

While most participants in the survey process completed a USAF JI, selected senior AFSC 4A2X1 personnel were also asked to complete booklets rendering judgments on task training emphasis (TE) or task difficulty (TD). The TE and TD booklets were processed separately from the JIs. The information gained from these task factor data is used in various analyses and is a valuable part of the training decision process.

TE is a rating of the amount of emphasis that should be placed on tasks in entry-level training. The 51 senior AFSC NCOs who completed a TE booklet were asked to select tasks they felt required some sort of structured training for entry-level personnel, and then indicate how much training emphasis these tasks should receive, from 1 (extremely low emphasis) to 9 (extremely high emphasis). Structured training is defined as training provided at resident technical schools, field training detachments, mobile training teams, formal on-the-job training (OJT), or any other organized training method. Interrater agreement from these 51 raters was acceptable, having strong agreement among the raters. The average TE rating was 2.28, with a standard deviation of 1.40. Any task with a TE rating of 3.68 or above is considered to have a high TE.

TD is an estimate of the amount of time needed to learn how to do each task satisfactorily. The 50 senior NCOs who completed TD booklets were asked to rate the difficulty of each task using a 9-point scale (extremely low to extremely high). Interrater reliability was acceptable, with high agreement. Ratings were standardized so tasks have an average difficulty of 5.00 and a standard deviation of 1.00. Any task with a TD rating of 6.00 or above is considered to be difficult to learn.

When used in conjunction with the primary criterion of percent members performing, TE and TD ratings can provide insight into first-enlistment personnel training requirements. Such insights may suggest a need for lengthening or shortening portions of instruction supporting entry-level jobs.

SPECIALTY JOBS (Career Ladder Structure)

The first step in the analysis process is to identify the structure of the career ladder in terms of the jobs performed by the respondents. Comprehensive Occupational Data Analysis Programs assist by creating an individual job description for each respondent based on the tasks performed and relative amount of time spent on the tasks. A hierarchical clustering program compares all the individual job descriptions, locates those with the most similar tasks performed and time spent on tasks, and combines them to form a stage in the clustering sequence. In successive stages, new members are added to the initial group or new groups are formed based on the similarity of tasks performed and time spent. This process continues until as many respondents as possible are included in a group.

The basic group used in the hierarchical clustering process is the *Job*. When two or more jobs have a substantial degree of similarity in tasks performed and time spent on tasks, they are grouped together and identified as a *Cluster*. The structure of the career ladder is then defined in terms of clusters of jobs and independent jobs.

Overview of Specialty Jobs

The analysis procedure described above identified one cluster and three jobs within the survey sample. The division of jobs performed by DAFSC 4A2X1 personnel is illustrated in Figure 1, and a listing of those jobs is provided below. The group (GP) or stage (ST) number shown beside each title is a reference to computer-printed information; the number of personnel in each group or stage (N) is also shown.

**OVERVIEW OF SPECIALTY JOBS
(N = 431)**

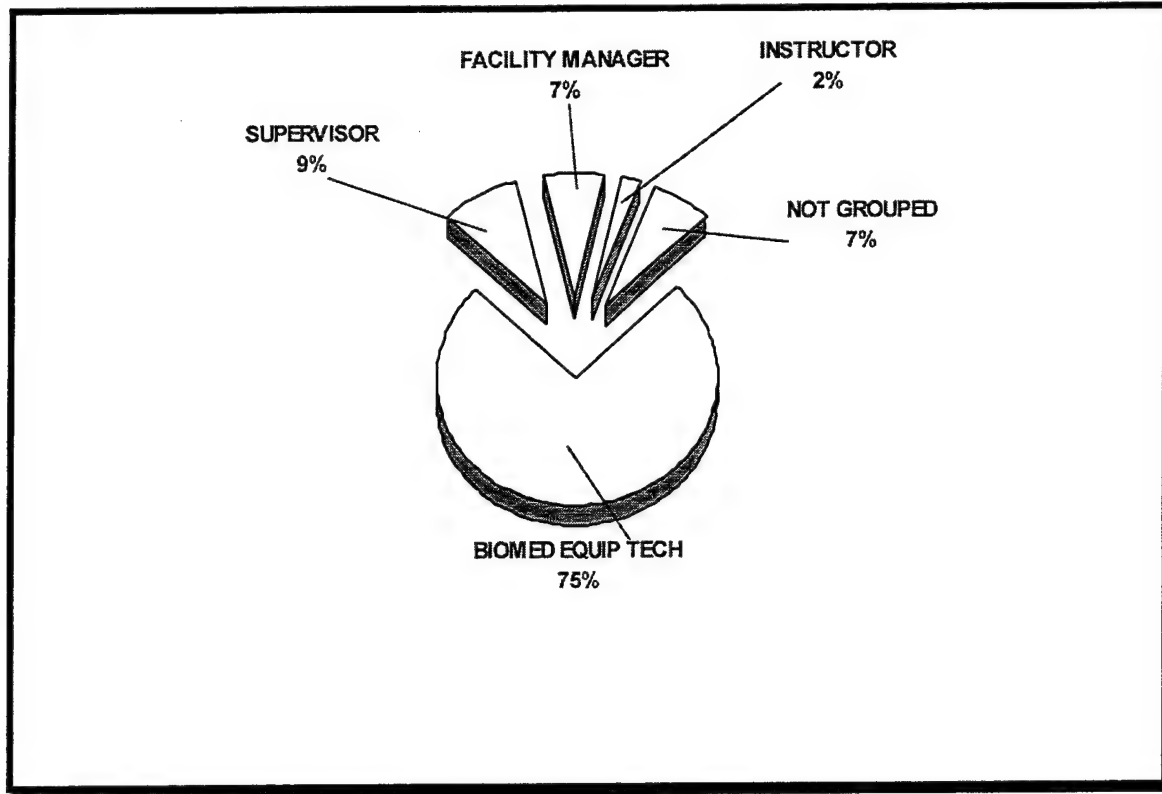


FIGURE 1

- I. BIOMEDICAL EQUIPMENT TECHNICIAN CLUSTER (ST016, N=321)
 - A. Dental Equipment Technician (ST056)
 - B. X-Ray Technician (ST049)
 - C. Medical Readiness Technician (ST142)
 - D. Clinic Technician (ST090)
- II. SUPERVISOR JOB (ST030, N=38)
- III. FACILITY MANAGER JOB (ST070, N=31)
- IV. INSTRUCTOR JOB (ST028, N=9)

The respondents forming these jobs account for 93 percent of the survey sample. The remaining 7 percent are performing tasks or a series of tasks which do not group with any of the defined jobs. Examples of job titles for these people include NCOIC Technical Support, Hospital Safety Manager, CDC Writer, NCOIC Medical Technology Assessment, and NCOIC Space Utilization.

Group Descriptions

The following paragraphs contain brief descriptions of the clustered jobs identified through the career ladder structure analysis. Table 3 presents the relative time spent on duties by members of these specialty jobs. Selected background data for these jobs are provided in Table 4. Representative tasks for all the jobs are contained in Appendix A.

I. BIOMEDICAL EQUIPMENT TECHNICIAN CLUSTER (ST016, N=321). The 321 airmen forming the Biomedical Equipment Technician (BMET) cluster account for 75 percent of the survey sample and perform the largest number of tasks. They are responsible for the core work of the career ladder. Their responsibilities include maintaining a wide range of biomedical equipment; performance of various operational and preventive maintenance inspections of biomedical equipment; and isolation of malfunctions. These personnel are located across a wide variety of MAJCOMs. Typical of the average 401 tasks performed are:

- perform electrical safety tests on medical equipment
- perform initial inspection of new medical equipment
- order parts or components
- calibrate or verify calibration of defibrillators
- perform preventive maintenance on defibrillators
- perform preventive maintenance on automatic blood pressure cuffs
- isolate malfunctions within infusion pumps
- process equipment turn-ins
- maintain historical maintenance records
- repair electronic thermometers

Fifty-nine percent of these airmen hold the 5-skill level, while 23 percent have a 3-skill level. The average time in the career field is just over 6 years, with an average of a little over 9 years total time in service. This cluster contains the highest number of members in their first-enlistment (18 percent). The paygrades range from E-2 to E-5, with E-4 and E-5 being the predominant paygrades. Furthermore, 83 percent of these members report they are assigned to units within the CONUS.

Within this large cluster, four distinct jobs were identified and warrant discussion. These were the (1) Dental Equipment Technician job (ST056, N=6); the (2) X-Ray Technician job (ST049, N=18); the (3) Medical Readiness Technician job (ST142, N=5); and the (4) Clinic Technician job (ST090, N=39).

The six members of the Dental Equipment Technician job are involved in maintaining equipment used in a dental clinic setting. Tasks representative of this group include:

- repair dental fiber optic systems
- isolate malfunctions within dental fiber optic systems
- perform preventive maintenance on panoramic dental x-ray systems
- isolate malfunctions within dental operating systems
- perform preventive maintenance on dental fiber optic systems
- repair dental operating systems

Personnel in the X-Ray Technician job deal with maintaining radiological equipment almost exclusively. Tasks representing this 18 member job include:

- calibrate or verify calibration of three-phase x-ray systems
- calibrate or verify calibration of fluorimaging systems
- calibrate or verify calibration of x-ray generators
- repair fixed radiographic x-ray systems
- isolate malfunctions within fixed radiographic x-ray systems
- isolate malfunctions within three-phase x-ray systems

The Medical Readiness Technician personnel perform tasks involving maintenance of field equipment for air transportable hospitals and clinics. These six personnel may find themselves working in contingency hospitals and occasionally performing in mobility exercises. Tasks representing this group include:

- build up or tear down air transportable hospital (ATH) pallets
- set up field power distribution systems
- start up or shut down field heater/air-conditioner systems
- assemble or disassemble field medical equipment
- perform preventive maintenance on field surgical lamp systems
- set up field sanitary sinks

The 39 members of the Clinic Technician job perform roughly the same tasks as other BMETs, with the following exception: these 39 members all work in a clinic and therefore maintain fewer pieces of equipment, resulting in fewer numbers of tasks performed (367).

II. SUPERVISOR JOB (ST030, N=38). The 38 personnel that form this job account for 9 percent of the survey sample. Unlike the technically-oriented job of the BMETs, personnel of this job primarily perform supervisory and management tasks. Fifty-one percent of their job

time is spent in Duty A, Supervision, with an additional 20 percent spent on Duty C, Performing General Administrative and Supply Activities (see Table 3). Commonly performed tasks include:

- draft outgoing correspondence
- supervise Biomedical Equipment Craftsmen (4A271) (formerly AFSC 91870)
- analyze workload requirements
- review Air Force Medical Logistics Letters (AFMLLs)
- write EPRs
- interpret policies, directives, or procedures for subordinates
- determine work priorities
- supervise Biomedical Equipment Journeymen (4A251) (formerly AFSC 91850)
- schedule personnel for schools, temporary duty (TDY) assignments, or nontechnical training
- counsel personnel, other than for training

The predominant paygrade in this supervisory job is E-7. Their average time in service is 17 years, with an average of 11.5 years in the career field. Sixty-one percent of the personnel performing this job hold a 7-skill level, with an additional 18 percent holding a 9-skill level. As expected, 92 percent of personnel in this job report supervising one or more personnel. Seventy-six percent of group members report they are assigned to CONUS.

III. FACILITY MANAGER JOB (ST070, N=31). Seven percent of the survey sample is comprised of this 31 member job. Facility Managers are responsible for coordinating maintenance of the facilities, conducting facilities' inspections, and evaluating construction requirements. The facility manager acts as the mediator between contractors and the hospital commander, overseeing such areas as waste disposal, parking concerns, housekeeping, and many other issues. Commonly performed tasks include:

- evaluate facility maintenance
- complete AF Forms 332 (Base Civil Engineer Work Requests)
- submit work order requests to BCEs
- coordinate maintenance of facilities with other agencies
- coordinate maintenance functions with Civil Engineering or other maintenance activities
- direct maintenance of medical facility grounds
- coordinate telecommunications acquisition, installation, and maintenance

- conduct facility fire safety and security inspections
- evaluate construction requirements
- determine facility custodial service requirements

Facility Managers hold primarily a 7-skill level, as reported by 68 percent of these members. Facility Managers average a little more than 8 years and 6 months in the career field and nearly 15 years and 6 months total service. The predominant paygrades for this job are E-6 and E-7. Sixty-one percent of these personnel report being assigned to CONUS.

IV. INSTRUCTOR JOB (ST028, N=9). Representing the smallest job, these 9 members account for 2 percent of the survey sample. Personnel in this job are all assigned to Sheppard AFB TX and are responsible for providing formal training to career ladder incumbents. Not surprisingly, 67 percent of their time is spent in Duty B, Training. Commonly performed tasks include:

- conduct resident course classroom training
- develop lesson plans
- prepare training aids
- score tests
- administer tests
- write test questions
- maintaining training records, charts, or graphs
- evaluate progress of resident course students
- procure training aids, space, or equipment
- counsel trainees on training progress

Seventy-eight percent of these airmen hold the 5-skill level and the remaining 22 percent hold the 7-skill level. The predominant paygrade of this specialty job is E-5. The average time in the career field is a little more than 7 years and 4 months, with an average of nearly 9 years total service. Eleven percent report being within their first enlistment.

Comparison of Current Jobs to Previous Survey Findings

The results of the specialty job analysis were compared to those of the last Biomedical Equipment Maintenance OSR published in 1989. As shown in Table 5, three of the four jobs in the current study were also identified in 1989 and were comprised of nearly identical percentages. The two survey sample sizes were nearly indistinguishable (440 versus 431), and a large group of technicians were identified as the core job in both studies.

TABLE 3

RELATIVE PERCENT TIME SPENT ON DUTIES BY SPECIALTY JOBS

DUTIES	Biomedical Technician (ST016) (N=321)	Supervisor (ST030) (N=38)	Facility Manager (ST070) (N=31)	Instructor (ST028) (N=9)
A Supervision	6	51	29	17
B Training	1	7	2	67
C Performing General Administrative and Supply Activities	8	20	13	9
D Performing General Maintenance Activities	4	3	2	4
E Maintaining Diagnostic Equipment	29	6	1	2
F Maintaining Diagnostic Support Equipment	16	3	*	1
G Maintaining Therapeutic Equipment	17	2	*	*
H Maintaining Therapeutic Support Equipment	16	2	*	0
I Performing Medical Readiness Activities	2	4	*	0
J Performing Facilities Management Activities	1	2	51	*

* Less than 1 percent

TABLE 4

SELECTED BACKGROUND DATA FOR SPECIALTY JOBS

	Biomedical Technician	Supervisor	Facility Manager	Instructor
NUMBER IN GROUP	321	38	31	9
PERCENT OF SAMPLE	75%	9%	7%	2%
PERCENT IN CONUS	83%	76%	71%	100%
DAFSC DISTRIBUTION:				
4A231	23%	3%	0%	0%
4A251	59%	13%	29%	78%
4A271	18%	61%	68%	22%
4A291	0%	18%	3%	0%
4A200	0%	5%	0%	0%
PREDOMINANT GRADE(S)	E-4/E-5	E-7	E-6/E-7	E-5
AVERAGE MONTHS IN CAREER FIELD	73	138	104	88
AVERAGE MONTHS IN SERVICE	113	214	185	106
PERCENT IN FIRST ENLISTMENT (1-48 MOS TAFMS)	18%	0%	3%	11%
PERCENT SUPERVISING	42%	92%	61%	22%
AVERAGE NUMBER OF TASKS PERFORMED	401	147	99	18

TABLE 5
COMPARISON OF JOB GROUPS IN CURRENT STUDY
VERSUS 1989 STUDY

1995 STUDY (N=431)	1989 STUDY (N=440)
Biomedical Equipment Technician (75% of sample)	Biomedical Maintenance Specialist (79% of sample)
Biomedical Supervisor (9% of sample)	Biomedical Supervisor (9% of sample)
Facility Manager (7% of sample)	Not Identified
Instructor (2% of sample)	Technical Training Personnel (3% of sample)

ANALYSIS OF DAFSC GROUPS

An analysis of DAFSC groups, in conjunction with the analysis of the career ladder structure, is an important part of each occupational survey. The DAFSC analysis identifies differences in tasks performed at the various skill levels. This information may then be used to evaluate how well career ladder documents, such as the AFMAN 36-2108 *Specialty Description* and the Career Field Education and Training Plan, reflect what career ladder personnel are actually doing in the field.

The distribution of skill-level groups across the career ladder jobs is displayed in Table 6, while Table 7 offers another perspective by displaying the relative percent time spent on each duty across the skill-level groups.

Skill-Level Descriptions

DAFSC 4A231. Representing 19 percent of the survey sample, these 81 airmen perform an average of 240 tasks. Ninety-three percent of these airmen are Biomedical Equipment Technicians (see Table 6).

Representative tasks performed by 3-skill level incumbents are listed in Table 8. Most tasks relate to Duty E (Maintaining Diagnostic Equipment), Duty G (Maintaining Therapeutic Equipment), and Duty H (Maintaining Therapeutic Support Equipment) (see Table 7).

DAFSC 4A251. Representing 52 percent of the survey sample (largest DAFSC group of the survey), these 222 airmen perform an average of 240 tasks. Most 5-skill level airmen (85 percent) are still Biomedical Equipment Technicians. However, 5-skill level personnel are also Facility Managers (4 percent), and Instructors (3 percent) (see Table 6).

Table 9 lists representative tasks performed by all 5-skill level personnel. Table 10 reflects those tasks which best differentiate 5-skill level personnel from their 3-skill level counterparts. The major difference among the two groups, as seen in Table 10, is that 5-skill level personnel perform a broader range of tasks, some being supervisory in nature.

DAFSC 4A271. The 117 members holding the 7-skill level represent 27 percent of the survey sample and perform an average of 162 tasks. Like their junior counterparts at the 3- and 5-skill levels, higher percentages of these personnel are working as Biomedical Equipment Technicians (49 percent), with an additional 20 percent working in the Supervisor Job. They are also represented in the Facility Manager specialty job (18 percent). Table 11 lists representative tasks performed by these airmen. Most of these tasks involve supervisory functions. Table 12 shows those tasks which best differentiate the 5- and 7-skill levels. As expected, the key difference is a much greater emphasis on supervisory functions at the 7-skill level.

DAFSC 4A291/4A200. Nine of the 11 members of this combined group are found within the Supervisor Job. The other two are in the BMET and Facility Manager positions. As seen in Table 13, these personnel are performing almost exclusively Duty A (Supervision) and some of Duty C (Performing General Administrative and Supply Activities). Tasks which best differentiate between the 9- and CEM-skill level are seen in Table 14. Clearly, the CEMs are more involved with supervisory related tasks (Duty A) than the 7-skill level which is performing a variety of more technically-oriented tasks.

Summary

Progression in this career ladder follows a regular pattern of highly technical job focus at the lower skill levels, with a broadening into supervision at the 7-skill level. Incumbents are performing primarily the core job of biomedical equipment maintenance at the 3- and 5-skill levels. Craftsmen at the 7-skill level are beginning to shift to supervision tasks, but a good deal of their job time is still spent in the technical arena. The 9-skill level and CEM personnel are primarily managers.

TABLE 6

DISTRIBUTION OF DAFSC GROUP MEMBERS ACROSS SPECIALTY JOBS
(PERCENT RESPONDING)

<u>SPECIALTY JOBS</u>	DAFSC 4A231 (N=81)	DAFSC 4A251 (N=222)	DAFSC 4A271 (N=117)	DAFSC 4A291 (N=8)	DAFSC 4A200 (N=3)
I. Biomedical Technician	93	85	49	0	33
II. Supervisor	1	2	20	88	67
III. Facility Manager	0	4	18	12	0
IV. Instructor	0	3	1	0	0
Not Grouped	6	6	12	0	0

TABLE 7

RELATIVE PERCENT TIME SPENT ON DUTIES BY DAFSC GROUPS

DUTIES	DAFSC 4A231 (N=81)	DAFSC 4A251 (N=222)	DAFSC 4A271 (N=117)	DAFSC 4A291 (N=8)	DAFSC 4A200 (N=3)
A Supervision	4	7	25	60	60
B Training	*	3	7	6	15
C Performing General Administrative and Supply Activities	10	8	13	18	8
D Performing General Maintenance Activities	5	4	3	1	4
E Maintaining Diagnostic Equipment	30	26	16	1	4
F Maintaining Diagnostic Support Equipment	13	15	9	1	3
G Maintaining Therapeutic Equipment	19	15	7	1	3
H Maintaining Therapeutic Support Equipment	16	15	8	1	1
I Performing Medical Readiness Activities	2	2	1	4	1
J Performing Facilities Management Activities	1	5	11	6	1

* Less than 1 percent

TABLE 8

REPRESENTATIVE TASKS PERFORMED BY 4A231 PERSONNEL

TASKS	PERCENT MEMBERS PERFORMING (N=81)
D174 Perform electrical safety tests on medical equipment	93
E257 Perform preventive on pulse oximeters	93
G848 Calibrate or verify calibration of defibrillators	90
E255 Calibrate or calibration of pulse oximeters	90
D187 Solder electrical connections	90
G850 Perform preventive maintenance on defibrillators	89
E274 Perform preventive maintenance on automatic blood pressure cuffs	88
G820 Perform preventive maintenance on electric hospital beds	88
E225 Perform preventive maintenance on ECG monitors	88
G836 Perform preventive maintenance on infusion pumps	88
D178 Perform initial inspections of new medical equipment	86
E222 Calibrate or verify calibration of electrocardiogram (ECG) monitors	86
C119 Complete equipment condition tags	85
E276 Calibrate or verify calibration of blood pressure monitors	85
E405 Perform preventive maintenance on vital sign monitor	85
E272 Calibrate or verify calibration of automatic blood pressure cuffs	85
G834 Calibrate or verify calibration of infusion pumps	85
E278 Perform preventive maintenance on blood pressure monitors	84
E273 Isolate malfunctions within automatic blood pressure cuffs	84
E349 Perform preventive maintenance on electronic thermometers	84
C127 Locate stock numbers or components in manufacturers' parts manuals or supply publications	83
E403 Calibrate or verify calibration of vital sign monitors	83
E347 Calibrate or verify calibration of electronic thermometers	83
C137 Order parts or components	80
C145 Review Air Force Medical Logistics Letters (AFMLLs)	77
C118 Complete AF Forms 1763 (Medical Maintenance Work Order)	72
C132 Maintain medical maintenance work order files	72
C124 Input maintenance data	64
A12 Determine work priorities	60
C135 Make entries in work order logs	48

TABLE 9
REPRESENTATIVE TASKS PERFORMED BY 4A251 PERSONNEL

TASKS	PERCENT MEMBERS PERFORMING (N=222)
D174 Perform electrical safety tests on medical equipment	85
E257 Perform preventive maintenance on pulse oximeters	84
E255 Calibrate or verify calibration of pulse oximeters	84
C127 Locate stock numbers or components in manufacturers' parts manuals or supply publications	82
G848 Calibrate or verify calibration of defibrillators	82
G850 Perform preventive maintenance on defibrillators	82
D187 Solder electrical connections	81
E222 Calibrate or verify calibration of electrocardiogram (ECG) monitors	81
E274 Perform preventive maintenance on automatic blood pressure cuffs	81
E272 Calibrate or verify calibration of automatic blood pressure cuffs	80
E225 Perform preventive maintenance on ECG monitors	80
E349 Perform preventive maintenance on electronic thermometers	80
E347 Calibrate or verify calibration of electronic thermometers	79
C137 Order parts of components	78
C145 Review Air Force Medical Logistics Letters (AFMLLs)	77
H1082 Perform preventive maintenance on steam sterilizers	77
E403 Calibrate or verify calibration of vital signs monitors	77
E405 Perform preventive maintenance on vital signs monitors	77
E276 Calibrate or verify calibration of blood pressure monitors	76
D171 Pack or unpack medical equipment	75
D178 Perform initial inspections of new medical equipment	75
E278 Perform preventive maintenance on blood pressure monitors	75
H1083 Repair steam sterilizers	73
H1081 Isolate malfunctions within steam sterilizers	73
G836 Perform preventive maintenance on infusion pumps	73
C119 Complete equipment condition tags	72
C124 Input maintenance data	61
A12 Determine work priorities	59
A36 Evaluate new equipment	58
C146 Review or make entries on AF forms 601 (Equipment Action Request)	57
C135 Make entries in work order logs	53

TABLE 10

TASKS WHICH BEST DIFFERENTIATE BETWEEN
DAFSCs 4A231 AND 4A251 PERSONNEL
(PERCENT MEMBERS PERFORMING)

TASKS	DAFSC 4A231 (N=81)	DAFSC 4A251 (N=222)	DIFF
G820 Perform preventive maintenance on electric hospital beds	88	63	+25
G819 Isolate malfunctions within electric hospital beds	81	58	+23
C118 Complete AF Forms 1763 (Medical Maintenance Work Order)	72	51	+20
G821 Repair electric hospital beds	80	61	+19
G815 Calibrate or verify calibration of pneumatic tourniquets	65	50	+15
H1108 Perform preventive maintenance on blood warmers	65	51	+15
G825 Calibrate or verify calibration of hypo/hyperthermia units	70	56	+15
G836 Perform preventive maintenance on infusion pumps	88	73	+14
G877 Perform preventive maintenance on infant warmers	69	55	+14
H1106 Calibrate or verify calibration of blood warmers	63	49	+14
G883 Calibrate or verify calibration of transportable infant incubators	63	49	+14
H1114 Perform preventive maintenance on surgical tables	69	55	+14
E467 Isolate malfunctions within three-phase x-ray systems	20	46	-26
C130 Maintain general correspondence with suspense files	9	34	-26
D188 Solder or sweat plumbing connections	23	48	-25
F705 Isolate malfunctions within ID cameras	17	42	-25
F707 Repair ID cameras	19	42	-24
F534 Install centrifuges, other than microhematocrit or refrigerated	26	50	-24
H969 Repair dental furnaces	27	50	-23
H1099 Isolate malfunctions within vacuum pumps	20	43	-23
E469 Repair three-phase x-ray systems	22	45	-22
A38 Evaluate personnel for compliance with performance standards	11	33	-22
H1025 Repair laboratory shaking devices	15	37	-22
A10 Counsel personnel, other than for training	10	32	-22

TABLE 11

REPRESENTATIVE TASKS PERFORMED BY 4A271 PERSONNEL

TASKS	PERCENT MEMBERS PERFORMING (N=117)
C145 Review Air Force Medical Logistics Letters (AFMLLs)	86
A12 Determine work priorities	79
A1 Analyze workload requirements	74
A78 Write EPRs	74
A10 Counsel personnel, other than for training	74
C121 Draft outgoing correspondence	70
A54 Interpret policies, directives, or procedures for subordinates	66
A38 Evaluate personnel for compliance with performance standards	66
C146 Review or make entries on AF Forms 601 (Equipment Action Request)	66
A61 Plan equipment installations or modifications	65
A6 Coordinate maintenance activities with other medical departments	64
A35 Evaluate maintenance or use of workspace	64
A11 Determine general logistics requirements, such as space, personnel, equipment, or supplies	63
A7 Coordinate maintenance functions with Civil Engineering or other maintenance activities	62
A71 Supervise Biomedical Equipment Journeymen (4A251) (Formerly AFSC 91850)	62
A65 Plan work assignments	62
A25 Establish Contractor services	57
C139 Participate in hospital safety committee activities	56
A59 Perform quality assurance evaluations of contractor performed services	56
C113 Compile data for reports	53
C142 Process equipment turn-ins	53
A42 Evaluate safety or security programs	52
D169 Maintain shop, hand, or power tools	52
A37 Evaluate operator maintenance	52
B87 Determine training requirements	51
C125 Inventory equipment, tools, or supplies	50
C140 Prepare cost estimates for replacement of equipment, repair parts, or supplies	46
A40 Evaluate procedures for storage, inventory, or inspection of property items	45
C114 Complete AF Forms 332 (Base Civil Engineer Work Request)	44
B90 Direct or implement training programs	43
C154 Validate Activity Back Order Report listings	42

TABLE 12

TASKS WHICH BEST DIFFERENTIATE BETWEEN
DAFSCs 4A251 AND 4A271 PERSONNEL
(PERCENT MEMBERS PERFORMING)

TASKS	DAFSC 4A251 (N=222)	DAFSC 4A271 (N=177)	DIFF
H955 Perform preventive maintenance on dental curing units	68	30	+38
E257 Perform preventive maintenance on pulse oximeters	84	47	+37
H1082 Perform preventive maintenance on steam sterilizers	77	40	+37
E403 Calibrate or verify calibration of vital sign monitors	77	40	+37
G808 Calibrate or verify calibration of electrosurgical equipment	75	38	+37
E274 Perform preventive maintenance on automatic blood pressure cuffs	81	45	+36
E301 Perform preventive maintenance on ophthalmoscopes	68	32	+36
E255 Calibrate or verify calibration of pulse oximeters	84	49	+36
E405 Perform preventive maintenance on vital sign monitors	77	42	+35
F533 Calibrate or verify calibration of centrifuges, other than microhematocrit or refrigerated	74	39	+35
E276 Calibrate or verify calibration of blood pressure monitors	76	41	+35
G810 Perform preventive maintenance on electrosurgical equipment	76	41	+35
E272 Calibrate or verify calibration of automatic blood pressure cuffs	80	45	+34
A54 Interpret policies, directives, or procedures for subordinates	23	66	-43
A10 Counsel personnel, other than for training	32	74	-42
A78 Write EPRs	33	74	-41
A68 Schedule personnel for schools, temporary duty (TDY) assignments, or nontechnical training	14	55	-41
A67 Schedule leaves and passes	16	56	-40
C121 Draft outgoing correspondence	30	70	-39
A39 Evaluate personnel for promotion, demotion, reclassification, or special awards	23	62	-38
A27 Establish performance standards	17	56	-38
A2 Assign personnel to duty positions	14	52	-38
A33 Evaluate budget requirements	19	57	-38
A30 Draft budget requirements	14	52	-37

TABLE 13

REPRESENTATIVE TASKS PERFORMED BY 4A291/4A200 COMBINED PERSONNEL

TASKS		PERCENT MEMBERS PERFORMING (N=11)
C121	Draft outgoing correspondence	100
A72	Supervise Biomedical Equipment Craftsmen (4A271) (formerly AFSC 91870)	100
A54	Interpret policies, directives, or procedures for subordinates	100
C139	Participate in hospital safety committee activities	100
A1	Analyze workload requirements	100
A63	Plan or prepare briefings	100
A33	Evaluate inspection report findings	100
A78	Write EPRs	100
A38	Evaluate personnel for compliance with performance standards	100
A52	Indorse enlisted performance reports	100
C145	Review Air Force Medical Logistics Letters (AFMLLs)	100
A12	Determine work priorities	100
A4	Conduct staff meetings	100
A39	Evaluate personnel for promotion , demotion, reclassification, or special awards	100
A34	Evaluate job or position descriptions	100
C113	Compile data for reports	91
A20	Direct development or maintenance of status indicators, such as boards, graphs, or charts	91
A32	Evaluate directives or operating procedures	91
C146	Review or make entries on AF Forms 601 (Equipment Action Request)	91
A41	Evaluate quality control procedures	91
A5	Coordinate equipment procurement with Director of Medical Logistics Management or Base Procurement Office	91

TABLE 14

TASKS WHICH BEST DIFFERENTIATE BETWEEN
DAFSCs 4A271 AND 4A291/4A200 PERSONNEL
(PERCENT MEMBERS PERFORMING)

TASKS	DAFSC 4A271 (N=177)	DAFSC 4A200/ 4A291 (N=11)	DIFF
E464 Perform preventive maintenance on fixed dental x-ray systems, other than panoramic	46	0	+46
E454 Perform preventive maintenance on panoramic dental x-ray systems	45	0	+45
E430 Perform preventive maintenance on fixed radiographic x-ray systems	45	0	+45
E465 Repair fixed dental x-ray systems, other than panoramic	44	0	+44
C142 Process equipment turn-ins	53	9	+44
D169 Maintain shop, hand, or power tools	52	9	+43
D174 Perform electrical safety tests on medical equipment	61	18	+43
E280 Calibrate or verify calibration of sphygmomanometers	42	0	+42
C119 Complete equipment condition tags	60	18	+42
C125 Inventory equipment, tools, or supplies	50	9	+41
F679 Repair automatic dental x-ray film processors	41	0	+41
G837 Repair infusion pumps	40	0	+40
E282 Perform preventive maintenance on sphygmomanometers	40	0	+40
A15 Develop organizational charts	23	91	-68
A34 Evaluate job or position descriptions	36	100	-64
A52 Indorse enlisted performance reports (EPRs)	39	100	-61
A72 Supervise Biomedical Equipment Craftsmen (4A271) (formerly AFSC 91870)	40	100	-60
A76 Update unit disaster preparedness plans or recall lists	18	73	-55
A4 Conduct staff meetings	45	100	-55
A69 Select individuals for training, other than specialty training	39	91	-52
A3 Assign sponsors for incoming personnel	39	91	-52
A75 Supervise civilians	21	73	-52
A9 Coordinate medical maintenance activities with Air Force Medical Logistics Office (AFMLO)	31	82	-51

ANALYSIS OF AFMAN 36-2108 *SPECIALTY DESCRIPTION*

Survey data were compared to the AFMAN 36-2108 *Specialty Description* for Biomedical Equipment, dated 31 October 1994. The overall specialty description for the 3-, 5-, 7-, and combined 9- and CEM skill levels briefly describes the technical and supervisory nature of jobs at the various levels. The description also reflects the primary tasks and responsibilities discussed in the **SPECIALTY JOBS** section of this report. The AFMAN 36-2108 *Specialty Description* accurately describes the technical aspects of Biomedical Equipment maintenance.

TRAINING ANALYSIS

Occupational survey data is one of the many sources of information which can be used to assist in the development of a training program relevant to the needs of personnel in their first enlistment. Factors which may be used in evaluating training include the overall description of the job being performed by first-enlistment personnel and their overall distribution across career ladder jobs, percentages of first-job (1-24 months TAFMS) or first-enlistment (1-48 months TAFMS) members performing specific tasks, as well as TE and TD ratings (previously explained in the **SURVEY METHODOLOGY** section).

First-Enlistment Personnel

In this study, there are 67 members in their first enlistment (1-48 months TAFMS), representing 16 percent of the total survey sample. The jobs performed by these personnel are highly technical in nature, with nearly all of their relative duty time spent on tasks pertaining to the maintenance of diagnostic and therapeutic equipment and the related support equipment (see Figure 2).

Table 15 displays the relative percent of time spent on duties by first-enlistment personnel. Reviewing the table, it is clearly evident that most first-enlistment personnel are performing tasks under Duty E (Maintaining Diagnostic Equipment), Duty G (Maintaining Therapeutic Equipment), and Duty H (Maintaining Therapeutic Support Equipment).

Table 16 lists representative tasks performed by AFSC 4A2X1 first-enlistment personnel, while Table 17 lists all of the test equipment used by 30 percent or more of first-enlistment airmen. Table 18 lists medical equipment that 30 percent or more first-enlistment airmen perform maintenance on.

FIRST-ENLISTMENT PERSONNEL JOBS
(N = 67)

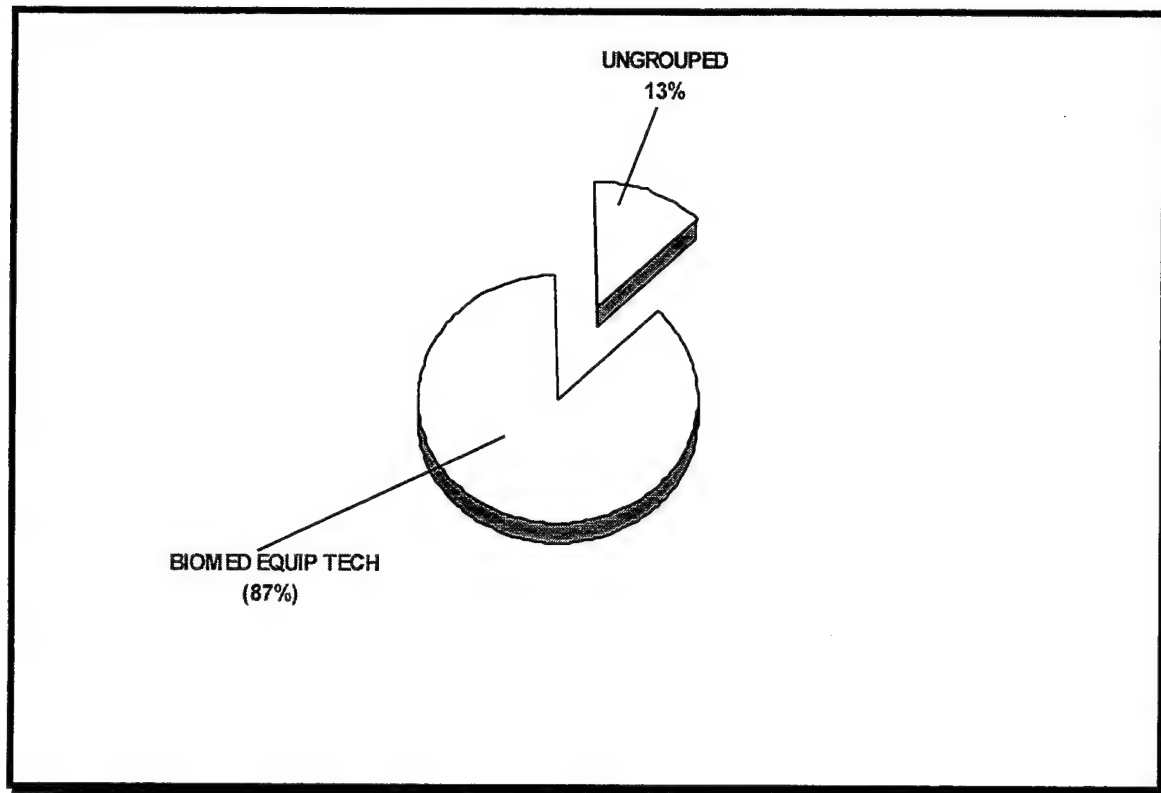


FIGURE 2

TABLE 15
RELATIVE PERCENT TIME SPENT ON DUTIES
BY FIRST-ENLISTMENT PERSONNEL
(N=67)

DUTIES		PERCENT TIME SPENT
A	Supervision	3
B	Training	1
C	Performing General Administrative and Supply Activities	10
D	Performing General Maintenance Activities	6
E	Maintaining Diagnostic Equipment	30
F	Maintaining Diagnostic Support Equipment	13
G	Maintaining Therapeutic Equipment	18
H	Maintaining Therapeutic Support Equipment	16
I	Performing Medical Readiness Activities	1
J	Performing Facilities Management Activities	2

TABLE 16
 REPRESENTATIVE TASKS PERFORMED BY AFSC 4A2X1
 FIRST-ENLISTMENT PERSONNEL
 (N=67)

TASKS		PERCENT MEMBERS PERFORMING
D174	Perform electrical safety tests on medical equipment	91
E257	Perform preventive maintenance on pulse oximeters	90
D187	Solder electrical connections	88
E255	Calibrate or verify calibration of pulse oximeters	87
E274	Perform preventive maintenance on automatic blood pressure cuffs	85
G848	Calibrate or verify calibration of defibrillators	85
G850	Perform preventive maintenance on defibrillators	85
E278	Perform preventive maintenance on blood pressure monitors	84
E276	Calibrate or verify calibration of blood pressure monitors	84
E405	Perform preventive maintenance on vital sign monitors	84
G836	Perform preventive maintenance on infusion pumps	84
C127	Locate stock numbers or components in manufacturer's parts manuals or supply publications	82
D178	Perform initial inspections of new medical equipment	82
E222	Calibrate or verify calibration of electrocardiogram	82
E403	Calibrate or verify calibration of vital sign monitors	82
E273	Isolate malfunctions within automatic blood pressure cuffs	82
E272	Calibrate or verify calibration of automatic blood pressure cuffs	82
E225	Perform preventive maintenance on ECG monitors	82
G834	Calibrate or verify calibration of infusion pumps	81
C119	Complete equipment condition tags	80
C137	Order parts or components	79
G820	Perform preventive maintenance on electric hospital beds	79
C145	Review Air Force Medical Logistics Letters (AFMLLs)	78
C118	Complete AF Forms 1763 (Medical Maintenance Work Order)	67
C124	Input maintenance data	61
A12	Determine work priorities	55
C135	Make entries in work order logs	49

TABLE 17

MEDICAL TESTING EQUIPMENT USED BY
30 PERCENT OR MORE FIRST-ENLISTMENT AFSC 4A2X1 PERSONNEL
(PERCENT RESPONDING)

<u>EQUIPMENT</u>	<u>1ST JOB (N=27)</u>	<u>1ST ENL (N=67)</u>
Multimeter	93	96
Safety Analyzer	96	96
Oscilloscope	89	94
Defibrillator Analyzer	85	91
Stop Watch	85	91
Tachometer	74	87
Electrosurgical Analyzer	67	84
Pressure Gauge	78	84
Decade Resistor Box	59	81
Power Supply	59	78
Infusion Pump Analyzer	59	76
Blood Pressure Calibrator	63	75
Weights	67	75
Physiological Simulator	52	73
Temperature Monitor	59	73
Electrocardiogram (ECG) Analyzer	63	72
Gas Flow and Pressure Meter	56	69
Battery Analyzer	56	66
Ultrasonic Wattmeter	30	63
Ground Fault Circuit Checker	41	60
Lag Thermometer	33	60
Vacuum Gauge	48	57
X-Ray Pulse Counter	26	50
X-Ray Phantom	33	49
Audiometer Calibrator	48	48
Mass Meter	30	45
Function Generator	37	43
Conductivity Tester	30	42
High Voltage Probe	26	42
Photometer	30	40
Signal Generator	41	40
Dynalyzer System	26	39
High Voltage Bleeder	7	37
Ultrasound Phantom	33	36
Ramp Generator	33	34
Laser Wattmeter	11	33
Non-invasive Kilivolt Peak Analyzer	15	33
Logic Clip and Probe	15	31
Logic Troubleshooting Kit	15	31
Gas Concentration Analyzer	11	30
Strain Gauge	22	30

TABLE 18

MEDICAL EQUIPMENT MAINTAINED BY
30 PERCENT OR MORE FIRST-ENLISTMENT AFSC 4A2X1 PERSONNEL
(PERCENT RESPONDING)

<u>EQUIPMENT</u>	<u>1ST JOB</u> <u>(N=27)</u>	<u>1ST ENL</u> <u>(N=67)</u>
Blood Pressure Monitor, Automatic	96	93
Defibrillator	89	93
Electrocardiograph (ECG)	78	90
Blood Pressure Cuff	89	88
Infusion Pump	85	88
Pulse Oximeter	78	88
Examination Lamp	85	84
Sterilizer, Steam	74	84
Centrifuge, other than Refrigerated/Microhematocrit	74	82
Examination Table	81	82
Hospital Bed	78	82
Dental Operating Chair	74	81
Dental Operating Lamp	70	81
Electric Bed	74	81
Vital Sign Monitor	74	81
Automatic Dental X-Ray Film Processor	63	78
Dental Curing Unit	67	78
Electrosurgical System	63	78
Hypo/Hyperthermia Unit	59	78
Amalgamator	63	76
Otoscope	63	76
Cast Cutter	56	75
Dental Handpiece	70	75
Oxygen Analyzer	59	75
Temperature Monitor	59	75
X-Ray Film Processor	56	75
Dental X-Ray System, other than Panoramic	59	73
Infant Warmer	59	73
Slit Lamp	56	73
Surgical Lamp	56	73
Audiometer	78	72
Blood Warmer	48	72
Dental Operating Unit	56	72
Dental Ultrasonic Cleaner	56	72
Infant Incubator	52	72
Pneumatic Tourniquet	52	72
Dental Fiber Optic System	63	70
Dental Ultrasonic Prophylaxis Unit	63	70
Electronic Thermometer	59	70
Exercise Bicycle	67	70
Pediatric Scales	48	70
Sterilizer, Washer	52	70
Laboratory Microscope	52	69

TABLE 18 (CONTINUED)

MEDICAL EQUIPMENT MAINTAINED BY
30 PERCENT OR MORE FIRST-ENLISTMENT AFSC 4A2X1 PERSONNEL
(PERCENT RESPONDING)

<u>EQUIPMENT</u>	<u>1ST JOB (N=27)</u>	<u>1ST ENL (N=67)</u>
Scales or Balances, other than Pediatric	52	69
Treadmill	44	69
Infant Care Center	52	67
Surgical Table, other than Field	48	67
Incubator	37	66
Ophthalmoscope	44	66
Intermittent Suction Unit	63	64
Sphygmomanometer	48	64
Suction/Pressure System	59	64
Wheelchair, other than Electric	52	64
Mobile Radiographic X-Ray System	41	63
Warming Cabinet	37	63
Audiometer Booth	70	61
Cryosurgical Unit	37	61
Eye Chart Projector	37	61
Fetal Heart Monitor	41	61
Panoramic X-Ray System	52	61
X-Ray Generator	37	61
X-Ray Table	33	61
Cardiopulmonary Resuscitation Training Mannequin	44	60
Laboratory or Pharmacy Refrigerator	56	60
Manual Bed	63	60
Apnea Monitor	33	58
Collimator/Beam Limiting Device	44	58
Heat Sealer	37	58
Transportable Incubator	33	58
Vacuum/Suction Pump	48	58
Refrigerated Blood Bank	44	57
Tympanometer	33	57
Cell Washer	37	55
Dental Shell or Sandblasting Unit	33	55
Stationary Dental X-Ray System, other than Panoramic	33	55
Ventilator, other than Pediatric	41	55
Automatic Pill Counter	44	54
Dental Furnace	33	54
Ultrasonic Fetal Doppler	33	54
Blood Pressure Monitor, other than Automatic	52	52
Dental Mixer Investor	37	52
Bone Saw	33	51
Dental Suction Machine	44	51
Fiber Optic System, other than Dental	33	51
Flowmeter	37	51
Heart Rate Monitor	33	51

TABLE 18 (CONTINUED)

MEDICAL EQUIPMENT MAINTAINED BY
30 PERCENT OR MORE FIRST-ENLISTMENT AFSC 4A2X1 PERSONNEL
(PERCENT RESPONDING)

<u>EQUIPMENT</u>	<u>1ST JOB (N=27)</u>	<u>1ST ENL (N=67)</u>
Oxygen Regulator	22	51
Phoropter	30	51
Traction Equipment	26	51
Ear, Nose, and Throat (ENT) Chair	33	49
Keratometer	26	49
Neonatal Monitor	22	49
Optical Microscope	30	49
Silver Recovery Unit	30	49
Spot Film Device	26	49
Tilt Table	19	49
Treatment Table	19	49
Ultrasonic Stethoscope	22	49
Diagnostic Ultrasound Imaging System	33	48
Ultrasonic Therapy System	30	48
Automixer	22	46
Bacteriological Incubator	22	46
Coagulator	44	46
Colposcope	30	46
Dental Surgical Air Drill	37	46
Lens Measuring Instrument	19	46
Lensometer	22	46
Tonometer	30	46
Blood Gas Analyzer	33	45
Cell Counter	26	45
Dental Lathe	22	45
Dental Oral Evacuator	37	45
Dental Water Bath	30	45
Insufflator	26	45
Mammography System	26	45
Obstetric Delivery Lamp	15	45
Obstetric Delivery Table	15	45
Pediatric Ventilator	19	45
Spirometer	26	45
Sterilizer, Chemical	26	45
Dental Casting Machine	22	43
Dental Pulp Tester	26	43
Oxygen Blender	22	43
Respiration Monitor	22	43
Sigmoidoscope	22	43
Bone Drill	19	42
Microhematocrit Centrifuge	26	42
Refrigerated Centrifuge	41	42

TABLE 18 (CONTINUED)

MEDICAL EQUIPMENT MAINTAINED BY
30 PERCENT OR MORE FIRST-ENLISTMENT AFSC 4A2X1 PERSONNEL
(PERCENT RESPONDING)

<u>EQUIPMENT</u>	<u>1ST JOB (N=27)</u>	<u>1ST ENL (N=67)</u>
Three-Phase X-Ray System	19	42
X-Ray Tube Suspension System	22	42
Dental Air Compressor	33	40
Mixing Vibrator	15	40
Surgical Microscope	19	40
Telemetry System	19	40
Ultrasonic Cleaning System, other than Dental	15	40
Contrast Densitometer	15	39
Paraffin Bath	19	39
Slide Stainer	15	39
X-Ray Illuminator, other than Motorized	7	39
Exercise Table	19	37
Anesthesia System	22	36
Arrhythmia Monitor	15	36
Dental Central Vacuum System	22	36
Dental Engine	15	36
Depth Perception Test Equipment	26	36
Image Intensification System	26	36
Spectrophotometer	26	36
Vision Measurement Instrument	22	36
Dental Model Trimmer	26	34
Laryngoscope	19	34
Pacemaker	19	34
Video Cart	15	34
X-Ray TV System	7	34
Addressograph	30	33
Dermatome	22	33
Diathermy Unit	22	33
Food Cart	15	33
Hydrotherapy System	15	33
Mobile Fluoroscopic X-Ray System	15	33
Oxygen Tent Assembly	11	33
Scope Washer	15	33
X-Ray Film Duplicator	19	33
Bilirubin Lamp	11	31
Dental Electrocautery Unit	22	31
Distilling Apparatus	15	30
Fluorimaging System	15	30
Overbed or Bedside Table	15	30
Vacuum Cleaner	26	30
Vaporizer	22	30
X-Ray Film Identifier	7	30

Training Emphasis (TE) and Task Difficulty (TD) Data

TE and TD data are secondary factors that can assist technical school personnel in deciding which tasks should be emphasized in entry-level training. These ratings, based on the judgments of senior career ladder NCOs working at operational units in the field, are collected to provide training personnel with a rank-ordering of those tasks in the JI considered important for first-enlistment personnel training (see Table 19 for the top-rated tasks), along with a measure of the difficulty of the JI tasks (see selected high rated tasks presented in Table 20). When combined with data on the percentages of first-enlistment personnel performing tasks, comparisons can then be made to determine if training adjustments are necessary. For example, tasks receiving high ratings on both task factors, accompanied by moderate to high percentages performing, may warrant resident training. Those tasks receiving high task factor ratings, but low percentages performing, may be more appropriately planned for OJT programs within the career ladder. Low task factor ratings may highlight tasks best omitted from training for first-enlistment personnel, but this decision must be weighed against percentages of personnel performing the tasks, command concerns, and criticality of the tasks.

To assist technical school personnel, AFOMS has developed a computer program that incorporates these secondary factors and the percentage of first-enlistment personnel performing each task to produce an Automated Training Indicator (ATI) for each task. These indicators correspond to training decisions listed and defined in the Training Decision Logic Table found in Attachment 1, AETCR 52-22, and allows course personnel to quickly focus their attention on those tasks which are most likely to qualify for initial resident course consideration.

Table 19 presents technical tasks with the highest TE ratings for AFSC 4A2X1 first-enlistment airmen, while Table 20 displays those tasks AFSC 4A2X1 raters judged to be most difficult to learn. For example, TE raters (refer to Table 19) reported tasks involving defibrillators such as calibration, preventive maintenance, and isolation of malfunctions, require considerable training emphasis. As the data show, many airmen in their first job and within their first enlistment are performing these tasks. Table 20 shows TD raters reported installation of fixed radiographic x-ray machines, installation of fluorimaging systems, and related maintenance tasks dealing with radiological equipment to be difficult tasks to learn.

Various lists of tasks, accompanied by TE and TD ratings, and where appropriate, ATI information, are contained in the TRAINING EXTRACT package and should be reviewed in detail by technical school personnel. (For a more detailed explanation of TE and TD ratings, see Task Factor Administration in the **SURVEY METHODOLOGY** section of this report.)

TABLE 19

TASKS RATED HIGHEST IN TRAINING EMPHASIS

TASKS	TNG EMP*	PERCENT MEMBERS PERFORMING		TASK DIFF*
		1ST JOB (N=27)	1ST ENL (N=67)	
G848	6.90	78	85	5.64
G850	6.59	78	85	4.97
H1082	6.14	56	69	5.15
D174	6.10	96	91	3.73
G849	6.04	59	73	6.13
G808	5.96	56	75	5.61
E448	5.96	30	48	5.95
G810	5.94	59	76	5.07
E454	5.86	48	58	5.38
D187	5.84	89	88	4.00
E430	5.82	30	49	6.18
G834	5.80	81	81	5.07
E255	5.76	81	87	4.73
E222	5.76	70	82	5.54
E272	5.75	74	82	4.66
H1081	5.73	52	58	5.84
E225	5.73	74	82	5.05
H1079	5.71	44	57	5.30
G759	5.71	59	67	4.23
G851	5.69	56	72	5.94
D178	5.69	74	82	4.89

* Mean TE Rating is 2.28, and Standard Deviation is 1.40 (High TE = 3.68)

** Average TD Rating is 5.00

TABLE 20

TASKS RATED HIGHEST IN TASK DIFFICULTY

TASKS	TASK DIFF	PERCENT MEMBERS PERFORMING					TNG EMP
		1ST JOB (N=27)	1ST ENL (N=67)	DAFSC 4A251 (N=222)	DAFSC 4A271 (N=117)		
E428	7.82	11	16	27	15	2.67	
C120	7.71	4	4	19	23	1.37	
E433	7.70	4	12	18	14	2.43	
E467	7.45	11	24	45	35	4.08	
E419	7.45	0	6	5	3	1.51	
E434	7.42	7	27	44	36	5.08	
G861	7.41	0	1	3	0	1.37	
G853	7.38	0	3	1	0	1.24	
G855	7.38	0	3	1	0	.84	
E408	7.35	4	9	12	8	1.31	
E429	7.35	15	39	59	46	5.25	
G852	7.34	0	4	3	1	1.18	
F512	7.34	0	7	16	6	2.63	
D172	7.31	4	12	23	22	1.98	
Administration (FDA) standards							
F725	7.31	7	10	17	11	1.80	
G860	7.28	0	3	4	0	1.37	
E469	7.27	11	25	45	32	3.94	
F722	7.24	11	30	48	38	5.10	
E384	7.23	19	27	32	25	3.69	
E388	7.23	7	16	22	17	3.29	
G863	7.23	0	1	3	0	1.24	
E432	7.22	11	30	39	30	4.71	

* Average TD Rating is 5.00

TABLE 21

EXAMPLES OF STS ELEMENTS NOT SUPPORTED BY SURVEY DATA

STS REFERENCE/TASKS	3-LVL COURSE PROF CODE	PERCENT MEMBERS PERFORMING							TNG EMP*	TSK DIFF**
		IST	1ST	DAFSC	DAFSC	DAFSC	DAFSC	DAFSC		
		JOB (N=27)	ENL (N=67)	4A231 (N=81)	4A251 (N=222)	4A271 (N=177)				
17j(5)	-									
	Isolate malfunctions									
G769	Isolate malfunctions within diathermy units									
17k(3)	-	7	16	16	18	13	2.37	5.55		
	Perform preventive maintenance inspection									
G832	Perform preventive maintenance on hypodermic jet injectors	4	12	10	13	2	1.55	4.28		
17k(4)	-									
	Isolate malfunctions									
G831	Isolate malfunctions within hypodermic jet injectors	4	7	7	12	3	1.33	5.01		
17u(5)	2b									
	Isolate malfunctions									
G909	Isolate malfunctions within multi-gas analyzers	4	13	10	11	11	2.10	6.70		
17v(4)	-									
	Isolate malfunctions									
H1123	Isolate malfunctions within surgical laser systems	4	12	7	14	10	3.08	7.10		
18c(3)	-									
	Perform preventive maintenance inspection									
H1138	Perform preventive maintenance on water purification systems	11	15	14	16	6	2.10	3.82		
19a(2)(b)5d	-									
	Recording devices other than spot film									
E419	Isolate malfunctions within CINE systems	0	6	5	5	3	1.51	7.45		
19a(2)(d)3	-									
	Perform preventive maintenance inspection									
F694	Calibrate or verify calibration of film changing systems	4	4	4	4	4	1.06	5.84		

* Mean TE Rating is 2.28, and Standard Deviation is 1.40 (High TE = 3.68)

** Average TD Rating is 5.00

TABLE 21 (CONTINUED)
EXAMPLES OF STS ELEMENTS NOT SUPPORTED BY SURVEY DATA

STS REFERENCE/TASKS	3-LVL COURSE PROF CODE	PERCENT MEMBERS PERFORMING									
		1ST JOB (N=27)	1ST ENL (N=67)	DAFSC 4A231 (N=81)	DAFSC 4A251 (N=222)	DAFSC 4A271 (N=177)	TNG EMP*	TSK DIFF**			
19a(2)(e)4	-										
	Perform system calibration										
E190	Calibrate or verify calibration of angio injectors	0	7	5	9	6	1.16	6.41			
19a(2)(e)5	-										
	Isolate malfunctions within angio injectors										
E191	Isolate malfunctions within angio injectors	0	6	4	6	5	1.02	6.69			
19c(1)(c)	2b										
	Perform preventive maintenance inspection										
E229	Perform preventive maintenance on echocardiographs	11	16	14	18	13	3.37	5.07			
19c(1)(e)	2b										
	Isolate malfunctions										
E228	Isolate malfunctions within echocardiographs	11	13	11	14	9	2.94	5.94			
19d(3)(c)	-										
	Isolate malfunctions										
E215	Isolate malfunctions within cardiac output computers	4	12	12	12	6	2.14	6.25			
20c(4)	-										
	Isolate malfunctions within tissue processors										
20d(4)	-										
	Isolate malfunctions	0	13	16	18	9	1.67	5.73			
F651	Isolate malfunctions within optical magnifying equipment	4	15	11	14	9	1.75	4.44			
20f(3)	2b										
	Perform preventive maintenance										
F566	Perform preventive maintenance on electronic particle counters	4	7	6	9	6	2.61	5.37			

* Mean TE Rating is 2.28, and Standard Deviation is 1.40 (High TE = 3.68)

** Average TD Rating is 5.00

TABLE 21 (CONTINUED)

EXAMPLES OF STS ELEMENTS NOT SUPPORTED BY SURVEY DATA

STS REFERENCE/TASKS	3-LVL COURSE	PERCENT MEMBERS PERFORMING								TNG EMP*	TSK DIFF**
		1ST	1ST	DAFSC	DAFSC	DAFSC	DAFSC	DAFSC	DAFSC		
		JOB (N=27)	ENL (N=67)	4A231 (N=81)	4A251 (N=222)	4A271 (N=177)	4A271 (N=177)	4A271 (N=177)	4A271 (N=177)		
20f(4)	Isolate malfunctions										
20g(5)	F565 Isolate malfunctions within electronic particle counters Isolate malfunctions	0	6	4	7	4				2.10	6.36
20n(3)	F624 Isolate malfunctions within spectrophotometers Perform preventive maintenance inspection	4	13	14	18	7				2.45	5.81
20o(3)	E212 Perform preventive maintenance on arterial balloon pumps Perform preventive maintenance inspection	0	1	1	2	2				1.39	5.82
	G854 Perform preventive maintenance on heart-lung machines	0	6	5	2	0				1.29	6.33

* Mean TE Rating is 2.28, and Standard Deviation is 1.40 (High TE = 3.68)

** Average TD Rating is 5.00

TABLE 22

EXAMPLES OF TECHNICAL TASKS PERFORMED BY 20 PERCENT OR MORE
GROUP MEMBERS AND NOT REFERENCED TO THE STS

TASKS	PERCENT MEMBERS PERFORMING								TNG EMP*	TSK DIFF**
	1ST JOB (N=27)	1ST ASG (N=67)	DAFSC 4A231 (N=81)	DAFSC 4A251 (N=222)	DAFSC 4A271 (N=117)					
G851	56	72	77	74	44			5.69	5.94	
G868	33	58	64	57	33			5.61	5.13	
E405	78	84	85	77	42			5.53	4.86	
G870	41	63	67	60	33			5.53	4.58	
H1083	48	57	64	73	44			5.35	5.72	
E347	70	79	83	79	47			5.31	3.79	
G811	37	55	64	66	38			5.31	5.78	
E403	74	82	83	77	40			5.25	5.35	
E425	26	48	52	63	46			5.25	5.52	
E243	59	63	68	62	35			5.18	5.04	
E455	41	42	52	65	43			5.08	5.97	
G760	56	63	67	68	39			5.06	4.74	
E349	70	79	84	80	47			5.02	3.60	
G869	30	49	53	50	33			5.02	5.27	
E245	67	67	70	62	34			5.00	4.64	

Specialty Training Standard (STS)

A comprehensive review of STS 4A2X1, dated February 1994, was made by comparing survey data to STS elements. Technical school personnel from the 384th Training Squadron at Sheppard AFB TX matched JI tasks to appropriate STS sections and subsections. A complete computer listing displaying the percent members performing tasks, TE and TD ratings for each task, along with the STS matchings, has been forwarded to the technical school for their review of the training documents. A complete computer listing for equipment items and forms has also been forwarded to the school.

Typically, STS sections and subsections matched to tasks which have sufficiently high TE and TD ratings, and are performed by at least 20 percent of personnel in appropriate experience or skill-level groups (such as first-enlistment (1-48 months TAFMS) and 5- and 7-skill level groups), are considered to be supported and should be considered for inclusion in the STS. Likewise, paragraphs having tasks with less than 20 percent performing across all of the criterion groups should be considered for deletion from the STS.

STS paragraphs such as Electronic Principles, Medical Readiness, Career Ladder Progression, USAF Graduate Evaluation Program, AF Occupational Safety and Health Program, Professional and Patient Relationship, Publications, Medical Materiel Procedures, Maintenance Administration, Medical Equipment Control, Maintenance Management Functions, Facility/Equipment Interface, and Biomedical Principles (paragraphs 1-15) were not reviewed. Paragraphs 16-21 were thoroughly reviewed against the OSR data. Most were, in general, supported, in that tasks matched to the STS paragraphs generally had at least 20 percent of one criterion group performing the matched tasks. However, several paragraphs need to be carefully reviewed by SMEs for possible fine-tuning of content and proficiency codes.

Table 21 lists several examples of STS paragraphs which need to be reviewed by SMEs, either because they do not meet the 20 percent performing criteria, or the 3-skill level course proficiency code is not supported by the data. For example, paragraphs 17j(5), 17k(3), 17k(4), 17v(4), and 18c(3) need to be considered for deletion in future revisions due to small percentages (less than 20 percent) performing related tasks. Proficiency codes for paragraphs 17u(5), 19c(1)c, and 19c(1)e should be carefully reviewed. In paragraph 17u(5), only 13 percent of first-enlistment personnel perform related tasks, but the course teaches the item to the "2b" level. In paragraph 17s(3), 79 percent of first-enlistment personnel perform related tasks, yet the item is not taught at all in the course. Paragraph 13s(4) is similar, in that 58 percent of first-enlistment personnel perform related items, yet the item is not taught in the 3-skill level course. Perhaps a knowledge level for these items would be appropriate rather than the dash currently shown.

Tasks not matched to any element of the STS are listed at the end of the STS computer listing. Table 22 lists examples of tasks which were performed by 20 percent or more of criterion groups, but not matched to any STS item. Training personnel and SMEs should review these and other unreferenced tasks to determine their appropriateness in being included in the STS. These unreferenced tasks cover a wide variety of areas across the career ladder.

Plan of Instruction (POI)

An analysis of the POI for course J3ABR4A231 was not conducted for this report due to the recent revisions being worked at the technical training school.

JOB SATISFACTION ANALYSIS

An examination of the job satisfaction indicators of various groups can give career ladder managers a better understanding of some of the factors which may affect the job performance of airmen in the career ladder. Attitude questions covering job interest, perceived utilization of talents and training, sense of accomplishment from work, and reenlistment intentions were included in the survey booklet to provide indications of job satisfaction.

Table 23 presents job satisfaction data for AFSC 4A2X1 TAFMS groups, together with TAFMS data for a comparative sample of medical career ladders surveyed in 1994. The majority of the survey sample were extremely satisfied, with high percentages finding their jobs interesting, utilizing their talents and training, and gaining a high sense of accomplishment from their work. The intentions to reenlist for the AFSC 4A2X1 career ladder were a bit lower than other medical career ladders.

An indication of how job satisfaction perceptions have changed over time is provided in Table 24, where again TAFMS data for 1995 survey respondents are presented, along with data from respondents in the last OSR involving this career ladder in 1989 (AFSC 918X0). Comparison of job satisfaction indicator responses of the current survey TAFMS groups to those in the 1989 survey indicates no major change and are comparable to the 1989 corresponding groups.

In Table 25, a comparison of job satisfaction indicators for the specialty job groups shows BMETs, Supervisors, and Instructors responding positively to all the indicators listed. The only job group showing low satisfaction is Facility Managers. They consistently report the lowest indicators in job interest, utilization of talent, utilization of training, and sense of accomplishment, considerably lower than the other jobs in the career field.

Write-In Comments

When there are serious problems in a career ladder, survey respondents are usually quite free with write-in comments to address perceived problems in the field. Nearly all of the write-in comments pertained to the job of facility manager. These comments generally followed the same theme of "If you don't use it, you lose it," in regards to technical school training which many regarded as "excellent" and "more than adequate." The particular issues of facilities'

management addressed included a lack of formal training for facility managers, loss of BMET skills due to lack of utilization, and insufficient rank to carry out duties effectively. The following are actual comments made by AFSC 4A2X1 personnel:

“It would be extremely beneficial to all concerned if formal facility manager training was automatically scheduled whenever 4A2X1 personnel are assigned as facility managers.”

“Being a facility manager has been an OJT situation which has only minimally utilized my BMET training. I do not think that WAPS testing is entirely fair to a person doing facilities management. My skills at troubleshooting an electrical circuit are rusty at best.”

“As a cross trainee, it was very frustrating spending approximately 10 months at the technical school and arrive at my next duty station, and being told I was the facility manager -- a job I had no training for nor the desire to do. A great deal was spent on training me to repair medical equipment and I have been assigned to an area where those skills are not utilized. Think of the costly mistakes that could and would be made when an unqualified individual is made to do this job. My BMET training never taught me how to supervise construction projects, and in the interim, I lose my BMET skills. I may then get a PCS assignment to be NCOIC of a BMET shop--and me with no skills. I feel that if the preference is to use military versus civilians in this position, then it should be a separate career field, with knowledge of some aspects of civil engineering.”

TABLE 23

COMPARISON OF JOB SATISFACTION INDICATORS BY TAFMS GROUPS
(PERCENT MEMBERS RESPONDING)

	1-48 MOS TAFMS		49-96 MOS TAFMS		97+ MOS TAFMS	
	1995 4A2X1 (N=67)	COMP SAMPLE* (N=1384)	1995 4A2X1 (N=94)	COMP SAMPLE* (N=1039)	1995 4A2X1 (N=267)	COMP SAMPLE* (N=1953)
<u>EXPRESSED JOB INTEREST:</u>						
INTERESTING	94	72	86	72	87	72
SO-SO	3	16	6	16	9	18
DULL	3	12	7	12	4	10
<u>PERCEIVED UTILIZATION OF TALENTS:</u>						
FAIRLY WELL TO PERFECTLY	94	79	90	81	88	84
LITTLE OR NOT AT ALL	6	21	10	19	12	16
<u>PERCEIVED UTILIZATION OF TRAINING:</u>						
FAIRLY WELL TO PERFECTLY	93	91	91	88	78	86
LITTLE OR NOT AT ALL	7	9	9	12	22	14
<u>SENSE OF ACCOMPLISHMENT GAINED FROM WORK:</u>						
SATISFIED	87	71	81	73	75	74
NEUTRAL	4	14	7	11	10	9
DISSATISFIED	9	15	12	16	15	17
<u>REENLISTMENT INTENTIONS:</u>						
YES, OR PROBABLY YES	49	57	50	68	66	73
NO, OR PROBABLY NO	51	43	50	32	10	9
PLAN TO RETIRE	0	0	0	0	24	18

* Comparative sample of Medical career ladders surveyed in 1994 (includes 4C0X1, Mental Health Service, 4D0X1, Diet Therapy, 4E0X1, 4M0X1, Aerospace Physiology, 4N0X1, Medical Services, 4N1X1, Surgical Services, 4N1X1B, Surgical Services/Urology, 4N1X1C, Surgical Services/Orthopedics, 4N1X1D, Surgical Services/Otorhinolaryngology, 4U0X1, Orthotics, 4V0X1, Optometry, 4V0X1A, Ophthalmology, 4Y0X1, Dental Assistant, 4Y0X2, Dental Laboratory)

TABLE 24

COMPARISON OF CURRENT SURVEY AND 1989 TAFMS GROUPS
(PERCENT MEMBERS RESPONDING)

	1-48 MONTHS TAFMS		49-96 MONTHS TAFMS		97+ MONTHS TAFMS	
	1995 (N=67)	1989 918X0 (N=182)	1995 4A2X1 (N=94)	1989 918X0 (N=68)	1995 4A2X1 (N=267)	1989 918X0 (N=190)
<u>EXPRESSED JOB INTEREST:</u>						
INTERESTING	94	88	86	82	87	89
SO-SO	3	9	6	9	9	6
DULL	3	2	7	9	4	5
<u>PERCEIVED UTILIZATION OF TALENTS:</u>						
FAIRLY WELL TO PERFECTLY LITTLE OR NOT AT ALL	94 6	97 3	90 10	88 12	88 12	91 9
<u>PERCEIVED UTILIZATION OF TRAINING:</u>						
FAIRLY WELL TO PERFECTLY LITTLE OR NOT AT ALL	93 7	93 5	91 9	91 9	78 22	87 13
<u>REENLISTMENT INTENTIONS:</u>						
YES, OR PROBABLY YES	49	52	50	53	66	65
NO, OR PROBABLY NO	51	48	50	47	10	12
WILL RETIRE	0	0	0	0	24	23

TABLE 25

COMPARISONS OF JOB SATISFACTION INDICATORS BY SPECIALTY JOBS
(PERCENT MEMBERS RESPONDING)

	BIOMEDICAL TECHNICIAN (ST0016) (N=321)	SUPERVISOR (ST0030) (N=38)	FACILITY MANAGER (ST0070) (N=31)	INSTRUCTOR (ST0028) (N=9)
<u>EXPRESSED JOB INTEREST:</u>				
INTERESTING	91	89	77	89
SO-SO	6	6	16	0
DULL	3	5	7	11
<u>PERCEIVED UTILIZATION OF TALENTS:</u>				
FAIRLY WELL TO PERFECTLY LITTLE OR NOT AT ALL	94 6	95 5	71 29	100 0
<u>PERCEIVED UTILIZATION OF TRAINING:</u>				
FAIRLY WELL TO PERFECTLY LITTLE OR NOT AT ALL	92 8	76 24	39 61	89 11
<u>SENSE OF ACCOMPLISHMENT GAINED FROM WORK:</u>				
SATISFIED	86	58	58	78
NEUTRAL	6	10	13	22
DISSATISFIED	8	32	29	22
<u>REENLISTMENT INTENTIONS:</u>				
YES, OR PROBABLY YES	64	50	53	56
NO, OR PROBABLY NO	26	16	20	44
WILL RETIRE	10	34	27	0

IMPLICATIONS

This survey was initiated to provide current job and task data for use in evaluating the AFMAN 36-2108 *Specialty Description* and appropriate training documents.

Overall, survey data for the Biomedical Equipment Maintenance career ladder reflect a well functioning career ladder. Seventy-five percent of the job incumbents perform a core job relating to maintenance of various medical equipment across the Air Force. Good career ladder progression can be seen as one moves from the 3-skill level to the 9- or CEM-skill level. Job satisfaction appears to be extremely high among most personnel. Only Facility Manager incumbents showed any major problems related to their job satisfaction, especially in the perceived utilization of training. A comprehensive review of the STS found that most paragraphs were supported by the survey data. However, several paragraphs need to be reviewed for possible fine-tuning of content and 3-skill level proficiency codes.

APPENDIX A

**SELECTED REPRESENTATIVE TASKS PERFORMED BY
SPECIALTY JOB GROUPS**

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TABLE A1
BIOMEDICAL EQUIPMENT TECHNICIAN CLUSTER
(ST0016)

TASKS	PERCENT MEMBERS PERFORMING (N=321)
E257 Perform preventive maintenance on pulse oximeters	96
D174 Perform electrical safety tests on medical equipment	95
E255 Calibrate or verify calibration of pulse oximeters	95
G848 Calibrate or confirm calibration of defibrillators	94
G850 Perform preventive maintenance on defibrillators	93
E274 Perform preventive maintenance on automatic blood pressure cuffs	93
E222 Calibrate or verify calibration of electrocardiogram (ECG) monitors	92
E272 Calibrate or verify calibration of automatic blood pressure cuffs	91
E225 Perform preventive maintenance on ECG monitors	91
C127 Locate stock numbers or components in manufacturers' parts, manuals or supply publications	90
C187 Solder electrical connections	90
E349 Perform preventive maintenance on electronic thermometers	90
E347 Calibrate or verify calibration of electronic thermometers	89
D173 Perform initial inspections of new medical equipment	88
C137 Order parts or components	88
E405 Perform preventive maintenance on vital sign monitors	88
E276 Calibrate or verify calibration of blood pressure monitors	87
E278 Perform preventive maintenance on blood pressure monitors	87
G836 Perform preventive maintenance on infusion pumps	87
G834 Calibrate or verify calibration of infusion pumps	86
C119 Complete equipment condition tags	84
D171 Pack or unpack medical equipment	84
C145 Review Air Force Medical Logistics Letters (AFMLLs)	81

TABLE A2
SUPERVISOR CLUSTER
(ST0030)

TASKS		PERCENT MEMBERS PERFORMING (N=38)
A1	Analyze workload requirements	97
C145	Review Air Force Medical Logistics Letters (AFMLLs)	95
A11	Determine general logistics requirements, such as space, personnel, equipment or supplies	92
A10	Counsel personnel, other than for training	92
C121	Draft outgoing correspondence	89
A54	Interpret policies, directives, or procedures for subordinates	89
A12	Determine work priorities	89
A61	Plan equipment installations or modifications	89
A78	Write EPRs	87
A5	Coordinate equipment procurement with Director of Medical Logistics Management or Base Procurement Office	87
A30	Evaluate budget requirements	84
A38	Evaluate personnel for compliance with performance standards	84
A32	Evaluate directives or operating procedures	84
A68	Schedule personnel for schools, temporary duty (TDY) assignments, or nontechnical training	82
A71	Supervise Biomedical Equipment Journeymen (4A251) (formerly AFSC 91850)	79
A33	Evaluate inspection report findings	79
A63	Plan or prepare briefings	79
A72	Supervise Biomedical Equipment Craftsmen (4A271) (formerly AFSC 91870)	76
A27	Establish performance standards	76
A36	Evaluate new equipment	76
A69	Select individuals for training, other than specialty training	76
C146	Review or make entries on AF Forms 601 (Equipment Action Request)	74
A25	Establish contractor services	74
C139	Participate in hospital safety committee activities	68

TABLE A3
FACILITY MANAGER CLUSTER
(ST0070)

TASKS	PERCENT MEMBERS PERFORMING (N=31)
J1236 Coordinate maintenance of facilities with other agencies	100
J1250 Evaluate facility maintenance or repair requests	97
J1273 Submit work order requests to BCEs	97
J1274 Transmit service calls to BCEs	97
J1268 Prepare telecommunications work orders	97
C114 Complete AF Forms 332 (Base Civil Engineer Work Request)	94
J1238 Coordinate telecommunications acquisition, installation, and maintenance	94
J1237 Coordinate project alteration requirements with medical and BCE personnel	94
J1262 Perform service call follow-ups	94
J1232 Conduct follow-up inspections of maintenance or repair of medical activities	90
J1255 Maintain service or minor construction request logs	90
J1230 Conduct facility fire safety and security inspections	90
J1251 Inspect facilities semi-annually for environmental or safety hazards	90
J1267 Prepare single-line drawings to accompany work order requests	90
J1270 Review facility project drawings or specifications	90
A7 Coordinate maintenance functions with Civil Engineering or other maintenance activities	87
J1253 Maintain work request status logs	87
J1249 Evaluate construction requirements	87
A42 Evaluate safety or security programs	87
C139 Participate in hospital safety committee activities	84
J1257 Oversee construction projects	84
J1242 Determine installation or operational requirements for new equipment	84
J1246 Direct maintenance of medical facility grounds	81
D167 Inspect facilities for adequate utilities	74

TABLE A4
INSTRUCTOR CLUSTER
(ST0028)

TASKS	PERCENT MEMBERS PERFORMING (N=9)
B88 Develop lesson plans	100
B104 Prepare training aids	100
B111 Write test questions	100
B84 Conduct resident course classroom training	89
B107 Score tests	89
B81 Administer tests	89
B102 Maintain training records, charts, or graphs	67
B96 Evaluate progress of resident course students	67
A38 Evaluate personnel for compliance with performance standards	67
B86 Counsel trainees on training progress	67
B106 Procure training aids, space, or equipment	67
B85 Conduct training conferences or briefings	56
B101 Maintain training equipment	44
B90 Direct or implement training programs	44
B87 Determine training requirements	44
B95 Evaluate personnel for training needs	44
B99 Evaluate training methods, techniques, or programs	44
C145 Review Air Force Medical Logistics Letters (AFMLLs)	44
A54 Interpret policies, directives, or procedures for subordinates	44
D187 Solder electrical connections	44
B89 Develop resident course or career development course	33
C125 Inventory equipment, tools, or supplies	33
D174 Perform electrical safety tests on medical equipment	22
B110 Write justifications for training facilities, equipment, publications, or materials	22